Remarks

Please amend claims 21, 22, 25 and 29 and add new claims 32-40 as indicated above.

Please cancel the present abstract and substitute therefore the new abstract set forth above. The Examiner will note that the new abstract closely follows amended claim 21.

In the official action the Examiner objects to the length of the abstract on page 2 of the official action. As the Examiner is no doubt aware, this application's parent application was filed long before the 150-word length limitation came into effect. Nevertheless, the Applicant submits herewith a new abstract which is patterned after claim 21 (as amended) and which includes fewer than 150 words. It is hopeful that the cancellation of the old abstract and the adoption of this new abstract that this grounds for objection will fall away.

Please amend the paragraph bridging pages 15 and 16 of the application as filed as indicated above. The specification amendment is a marked version of the paragraph showing the change which was made, which is simple to put the word "FILM" into lower case characters.

In claims 21, 25 the word "thin" has been deleted and the references to "a", "the" or "said" metal have also been deleted.

On page 3 of the official action the Examiner objects to claims 23 and 29. With respect to claim 29 that claim has been amended to be dependent upon claim 28 to thereby provide the antecedents for the terms for which the Examiner objected.

With respect to claim 23, the claim has not been amended. The Examiner asserts that the periodic table does not contain periods III, IV and V. With all due respect to the Examiner, the Examiner's assertion is not quite correct and, moreover, does not reflect the confusing nature of the periodic table. Enclosed herewith are three different

versions of the periodic table which were recently found on the Internet.

First, look at the periodic table from www.chemlab.pc.maricopa.edu. The Examiner will note that it certainly shows groups III, IV and V. Now compare the periodic table from www.periodictable.tsx.org with the periodic table from www.cs.ubc.ca. Look, in particular, for Gallium which occupies position 31 on the periodic table. According to one of these two periodic tables Gallium falls in group 3b but according to the other periodic table it falls in group 3a. A similar problem arises for Arsenic, element number 33. It is in group 5b according to one table but in group 5a according to another table.

It seems that the scientific world has not quite come to agreement on just how these groups should be identified in the periodic table. Perhaps the scientific world has just agreed to disagree. In any event, it is submitted that it would hardly be helpful to change claim 23 to add letter designations after the periods identified in that group.

Enclosed herewith is a copy of US Patent No. 6,387,793 which is a patent which issued on this application's parent application. Note claim 4 and the fact that the Examiner in charge of that application obviously had no problem with references to periods III, IV or V.

Next, the Examiner is requested to consider US Patent No. 6,571,028, a copy of which is also enclosed herewith. The Examiner is respectfully requested to note the other publications found on page 2 of that patent and particularly the articles by Arthur J. Nozik et al. and D. Bimberg et al. both of which use "III-V" in the titles of the articles. The Examiner will note that there are no lower case "a" or lower case "b" letters following the roman numerals. The reason is obvious in view of the lack of consensus in the scientific world as to just how the groups of elements are to be identified, as discussed above.

The Examiner is invited to do a search at the USPTO web site for "III-V". The Examiner will find that such nomenclature is even used in the title of a US patent.

The Examiner is respectfully requested to withdraw this grounds for objection. If the Examiner refuses to withdraw the objection, then the Applicant respectfully requests that the Examiner support his contentions with an Affidavit as required by 37 C.F.R. 1.104(d)(2).

The Examiner rejected claims 21-23 and 25-27 under 35 U.S.C. 102(b) as being anticipated by Mis et al. (US Patent No. 5,767,010).

As the Examiner will note by reference to the amendments made to the claims, claim 21 has been amended to more clearly differentiate it from the '010 patent. In particular, claim 21 now recites that the "underbump metallization" projects "from said substrate with an exposed sidewall" and that the metal referred to in claim 21 covers "the exposed sidewall of said multilayer underbump metallization."

This feature is shown in Figures 3 and 3a of the application as filed. See also the paragraph bridging pages 15 and 16 of the application as filed.

The Examiner rejected claims 28-31 under 35 U.S.C. (103) as being unpatentable over the '010 patent in view of Greer (US Patent No. 6,541,681). This grounds for rejection is respectfully traversed.

Claims 28-31 now appear, in a somewhat amended form, as claims 32-35.

Turning to the examiner's rationale for rejecting old claims 28-31, the Examiner asserts that it would be obvious to apply Greer's teachings of a sealant type titanium layer to Mis' solder bump structure. With all due respect to the Examiner, it is believed that the Examiner reads too much into the prior art.

What the Examiner appears to be asserting is that it would be somehow obvious to add a layer of titanium to Mis' underbump metallization in accordance with the teachings of Greer. First, the Examiner is invited to again review Figures 5 and 6 or 11 and 12 of Mis. As the Examiner will note, there is a layer identified by the numeral 28

immediately adjacent insulating film 26. Greer teaches a layer 504 which is immediately adjacent polyimide layer 502. The Examiner asserts that layer 504 is "made of titanium." The Examiner is respectfully requested to state for the record his basis for this statement, since the specification seems to state that layer 504 is "similar" to e.g. titanium (see column 5, lines 46 - 48).

Even assuming for the moment that sealant feature 504 of the '681 patent is made of titanium, why would a person of ordinary skill in the art insert a layer of titanium between Mis' layers 28 and 26? It is noted that Mis clearly identifies his layer 28 as being a layer of titanium. Why insert another layer of titanium? What is the motivation to do that?

It is noted that in the Examiner's rejection of claim 21, the Examiner makes reference to layer 28 of Mis reading upon the "thin layer" recited in claim 21. Of course, that limitation (without the word "thin") appears in claim 21 and also appears in claim 28 as well as in new claim 32. A sealant feature 7b is shown in Figures 3 and 3a of Applicant's application. The layer of metal is shown by reference numeral 7a. Note that the layer and the sealant feature both preferably extend beyond an edge or periphery of the underbump metallization 5. New claim 32 also recites that "the layer of metal and the sealant feature both extend outwardly beyond an edge or periphery of the multilayer underbump metallization." This feature also differentiates claim 32 from the art cited by the Examiner.

As the Examiner will note, three new claims, 36-38 have been added which depend either directly or indirectly from claim 32. Claim 36 recites that "the sealant feature is in contact with the layer of metal." Claims 37 and 38 recite that the sealant feature is ring or annular shaped as discussed at page 10 of the application as filed.

In summary, it is submitted that a person of ordinary skill in the art would not combine the teachings of the '010 patent with the '681 patent along the lines suggested by the Examiner.

The Examiner rejected claim 24 as being unpatentable over Mis in view of Kung (US Patent No. 6,179,200). This grounds for rejection is respectfully traversed.

The Examiner's rationale for combining the teachings of the '010 patent and the '200 patent is simply not understood.

First, Mis specifically teaches a multilayer underbump metallization comprising three layers, namely a chromium layer 30, a phased layer 32 of chromium and copper and a copper layer 34. Please see column 4, lines 17-27. The Examiner asserts that it would be obvious to a person of ordinary skill in the art to substitute titanium, nickel and gold for Mis' multilayer underbump metallization. The rationale which the Examiner puts forward for making this substitution is that it would be "within the general skill of a work in the art to select a known material on the basis of its suitability for the intended use as a matter of artist design choice".

With all due respect to the Examiner, a person of ordinary skill in the art would not do what the Examiner says. Mis clearly teaches that the underbump metallization 30, 32-34 are disposed upon a titanium barrier layer 28. So, if Mis' layer 28 is titanium, why make Mis' layer 30 also titanium based on the teaching of '200? The Examiner has not provided a rationale for a person of ordinary skill in the art to do that.

New claim 39 is added by the response. Claim 39 is also patterned after old claim 21, but the former thin layer now appears as "a plating membrane and non-wettable dam comprising a metal layer selected from a group consisting of chrome, a titanium-nickel-titanium composite, a titanium-nickel-chrome composite, a titanium-platinum-titanium composite, and a titanium-nickel-oxidized silicon composite deposited under and in contact with said multilayer underbump metallization and extending outwardly beyond a peripheral edge of said multilayer underbump metallization..." This limitation, which finds support in the embodiments of Figures 4 - 4(e), differentiates this claim from the cited art.

Reconsideration of this application as amended is respectfully requested.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136 (a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

I hereby certify that this correspondence is being deposited with the United States Post Office with sufficient postage as first class mail in an envelope addressed to Commissioner for Patents, POB 1450, Alexandria, VA 22313-1450 on

June 18, 2003

(Date of Deposit)

Corinda Humphrey

(Name of Person Signing)

Corinda Humphrey

(Signature)

June 18, 2003

(Date)

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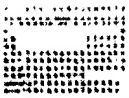


The Pictorial Periodic Table

I	II	IIIb	IVb	Vb	VIb	VIIb		VIIIb		Ib	IIb	III	IV	V	VI	VII	0
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La*	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac**	Rf	Db	Sg	Bh	Hs	Mt	Uun	Uuu	Uub		Uuq		Uuh		Uuo
Lanthanides *			Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	
Actinides **			Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	

Search the Pictorial Periodic Table:

Search **for elements with the following properties:**

10.0 > Density, g/mL > 12.0

Find **the following keywords in the element descriptions:**

gas

or liquid (not yet active)

and toxic (not yet active)

Graph **the following property:** Atomic Weight, u

for these elements: 1 to 112 .

Chart... **the properties below for a list of elements:** (not active now)

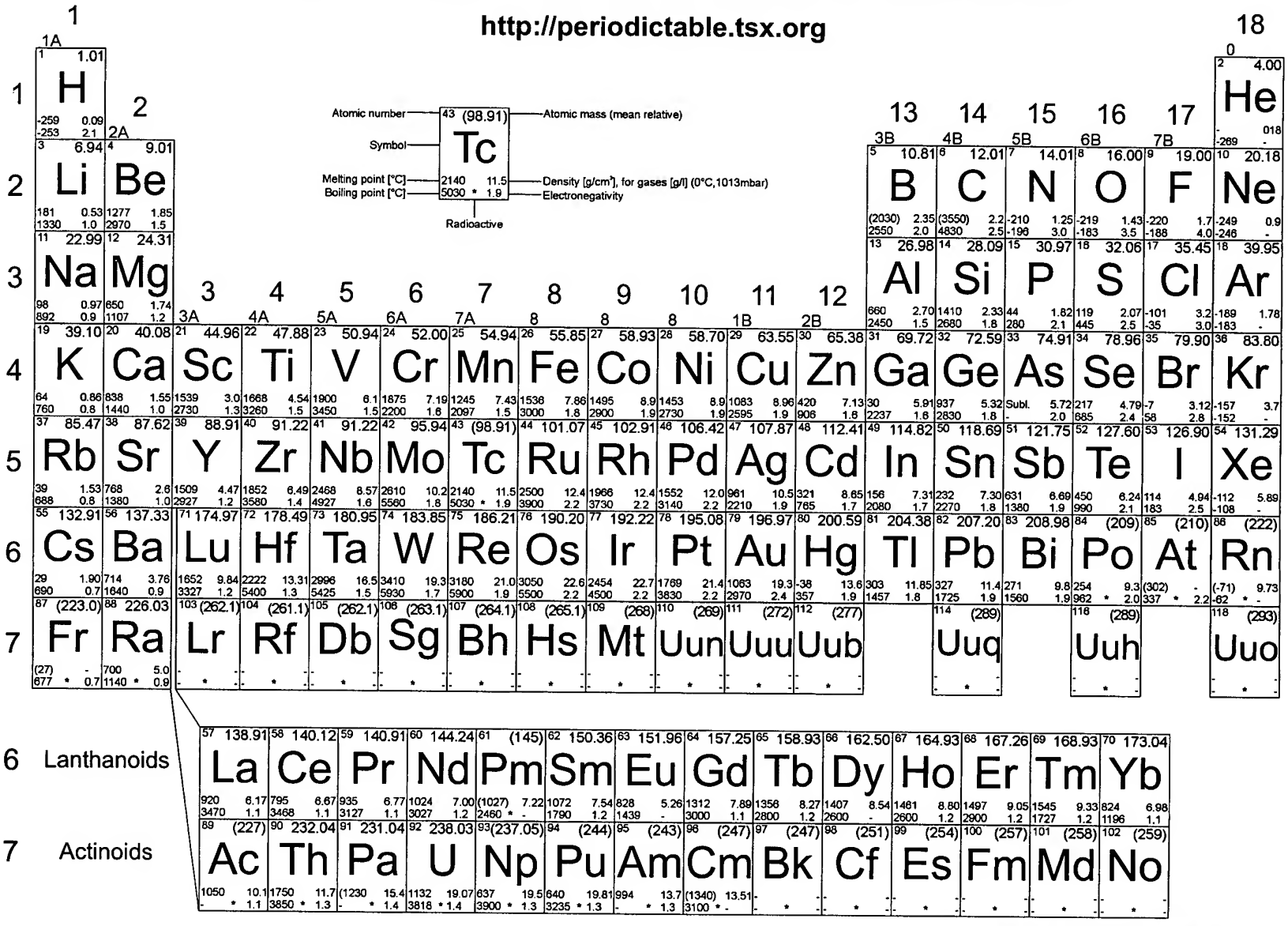
Element Name	Atomic Radius	Melting Point	Heat of Vaporization
Atomic Number	Covalent Radius	Boiling Point	Heat of Fusion
Atomic Weight	Density	Specific Heat	Electronegativity
Oxide Properties	Crystal Form	States	Ionization Potential

Periodic Table Tidbits:

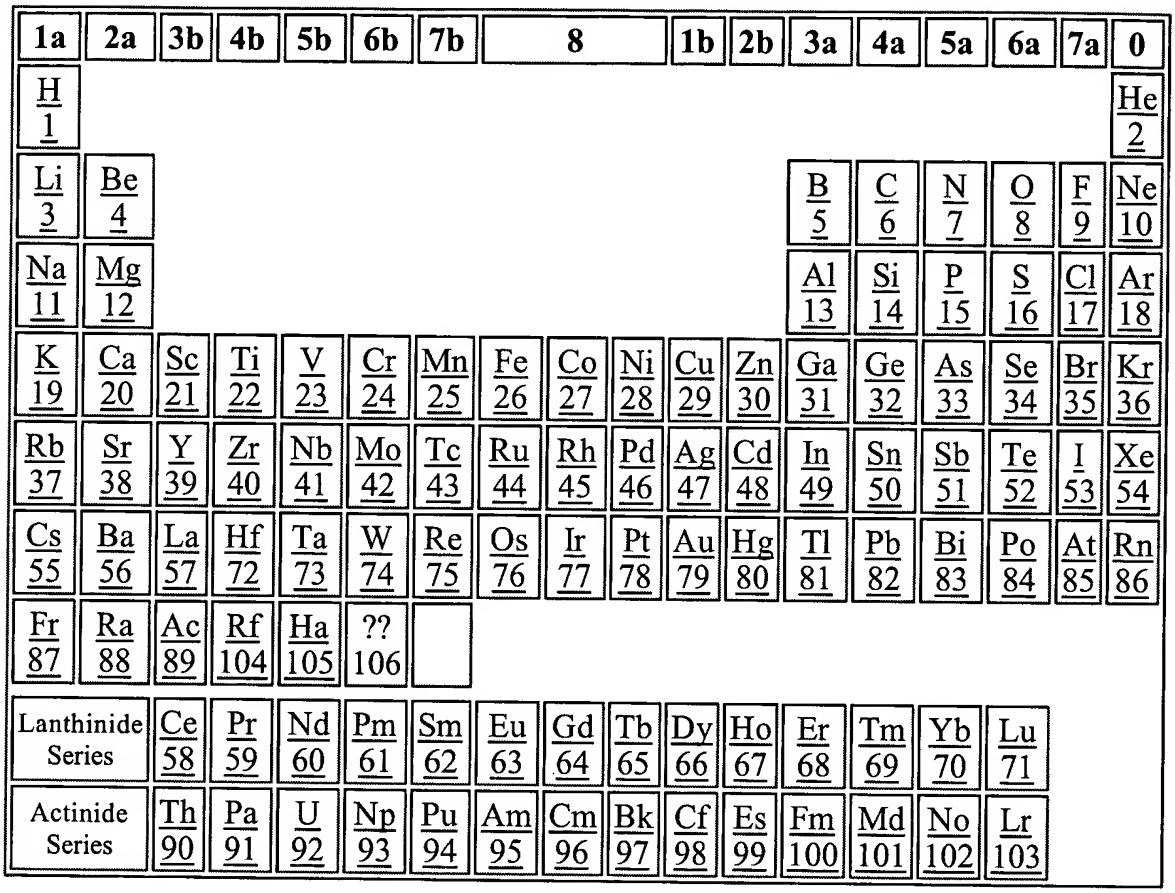
Alternate styles for the Periodic Table:

ChemGlobe - Periodic table of elements

http://periodictable.tsx.org



Periodic Table of the Elements



1a	2a	3b	4b	5b	6b	7b	8	1b	2b	3a	4a	5a	6a	7a	0
H 1															He 2
Li 3	Be 4									B 5	C 6	N 7	O 8	F 9	Ne 10
Na 11	Mg 12									Al 13	Si 14	P 15	S 16	Cl 17	Ar 18
K 19	Ca 20	Sc 21	Ti 22	V 23	Cr 24	Mn 25	Fe 26	Co 27	Ni 28	Cu 29	Zn 30	Ga 31	Ge 32	As 33	Se 34	Br 35	Kr 36
Rb 37	Sr 38	Y 39	Zr 40	Nb 41	Mo 42	Tc 43	Ru 44	Rh 45	Pd 46	Ag 47	Cd 48	In 49	Sn 50	Sb 51	Te 52	I 53	Xe 54
Cs 55	Ba 56	La 57	Hf 72	Ta 73	W 74	Re 75	Os 76	Ir 77	Pt 78	Au 79	Hg 80	Tl 81	Pb 82	Bi 83	Po 84	At 85	Rn 86
Fr 87	Ra 88	Ac 89	Rf 104	Ha 105	?? 106												
Lanthinide Series		Ce 58	Pr 59	Nd 60	Pm 61	Sm 62	Eu 63	Gd 64	Tb 65	Dy 66	Ho 67	Er 68	Tm 69	Yb 70	Lu 71		
Actinide Series		Th 90	Pa 91	U 92	Np 93	Pu 94	Am 95	Cm 96	Bk 97	Cf 98	Es 99	Fm 100	Md 101	No 102	Lr 103		

List by atomic number. List by name. List by symbol.

Go back to the elements page.